HNR

MECHANICAL CALCULATION COVER SHEET

Calculation No:3442.053.MCAL.005,
Calculation Title: AIR SEPARATOR SELECTION
Project ID # 100256
Project Title: CCN CHILLED WATER SYSTEM OPTIMIZATION MASTER PLAN

ORIGINAL AND REVISED CALCULATION/ANALYSIS APPROVAL

	Rev._A Name/Signature/Date	Rev. B Name/Signature/Date	Rev._0 Name/Signature/Date
Originator: DAVID WALKER			09/04/02
Checked By: MIKE SLAMAN			09/04/02
Approved By: MIKE SLAMAN			09/04/02
Other:			

AFFECTED DOCUMENTS

Document Number	Document Title	Rev. Number
3442.053.MCAL. .006	CCF/LDCC COOLING PLANT MODIFICATIONS sheets G-0001, M0001 through M-8006,	0

Record of Revision

Rev.	Reason for Revision
REV 0	ISSUED FOR CONSTRUCTION
	.

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Holmes & Narver | Raytheon

CALCULATION CHECKLIST

page ii of iii

Task/Project #: 100256
Task Order 053
CCN CHILLED WATER SYSTEM OPTIMIZATION MASTER PLAN

Calculation Number: 3442.053.MCAL.005 | Revision: 0

Reviewer/Checker : MIKE SLAMAN | Date: 7/31/02

Reviewer performed or supervised subject calculation.
X NO ____YES Justification Attachment _____, _____ pages

Alternate Verification method approved _____ Method _____

	ITEM(S) CHECKED	Accept Y/N	OBJECTIVE EVIDENCE Sheets		INITIAL/ DATE 7/31/02
1.	Cover forms properly completed.	Y			
2.	Calculation Sheet headers complete with calc. no., rev., etc.	Y			
3.	Calculation Sheet contents complete per format.	Y			
4.	Listed attachments included.	N/A			
5.	Calculation Objective clearly described.	Y			
6.	Criteria are suitable and properly referenced to task-specific documents.	Y			
7.	Assumptions and data described and attached or referenced to task documents.	Y			
8.	Calculation method identified and appropriate for the design activity.	Y			
9.	Calculation results reasonable and correctly described in Results and Conclusions.	Y			
10.	Computer Program identified with version and revision.	N/A			
11.	Computer Program references method used, etc.	N/A			
12.	Computer input/output provided.	N/A			
13.	Computer run traceable to calculation.	N/A			
14.	Computer input data within permissible design input range.	N/A			
15.	Computer Program validation/verification addressed.				

REMARKS

Mike Slaman
Checker Print Name & Sign
MIKE SLAMAN
Date 7/31/02

David F. Walker
Preparer Print Name & Sign
DAVID WALKER
Date 7/31/02

Holmes & Narver | Raytheon

MECHANICAL DESIGN CALCULATION SHEET

Project Title: CCN CHILLED WATER SYSTEM OPTIMIZATION MASTER PLAN

Project ID #100256

Calculation No. 3442.053.MCAL.005

Rev. No. 0

Calculation Title: AIR SEPARATOR SELECTION

PERFORMED BY : 6/25/02 DATE
DAVID WALKER

CHECKED BY 7/31/02 DATE
MIKE SLAMAN

INTRODUCTION

Purpose

The "Statement of Work" provided from LANL dated 7/24/01 states " Provide feasibility and Title II services to connect the CCF chilled water plant to the LDCC plant such that CCF chillers will be shut down and removed and the LDCC plant will be supplying chilled water to the CCF and outlying buildings." This work requires several objectives. The first five objectives re defined in the scope listed below.

Scope

1. Verify that the LDCC chiller plant can adequately support the cooling loads of both LDCC and CCF plants.
2. Develop a plan to modify the LDCC equipment room cooling system from an evaporative based system to a chilled water based system.
3. Add a larger chilled water expansion tank to the combined chilled water systems and air eliminator.
4. Modify chilled water pump impellers to match the combined chilled water pumping loads. Add backdraft dampers to air handling unit EC-1 supply fans.
5. Evaluate the LDCC 900 Ton chiller condenser water pump and replace it if necessary.

DESIGN BASIS

Design Inputs

1. Test and Balance data performed by the Kirk Air Co. on 7/17/01 for CCF and Ambient Air Balance Co. for LDCC on 02/02/90.
2. LDCC equipment room 189 cooling load calculations for LDCC Chiller Replacement Project I.D. 100015.
3. Results from the pipe model program "Pipe Flo" created by Engineered Software INC. See Calculaltion M003.
4. Manufacturers' equipment and installation requirements.

Criteria

Maintain LDCC equipment room at 70 to72^{0}F.

Limit plant shut downs- both LDCC and CCF plant

Assumptions

Future cooling loads identified under the "LDCC Chiller Replacement" project I.D. 100015 will not be realized.

Condensate piping that will be converted to chilled water piping can be properly cleaned and that the pressure drop through the piping will be minimal.

REFERENCES

Test and Balance data, and "LDCC Chiller Replacement" calculations referenced above. Also manufacturer data was used to match equipment parts to existing equipment.

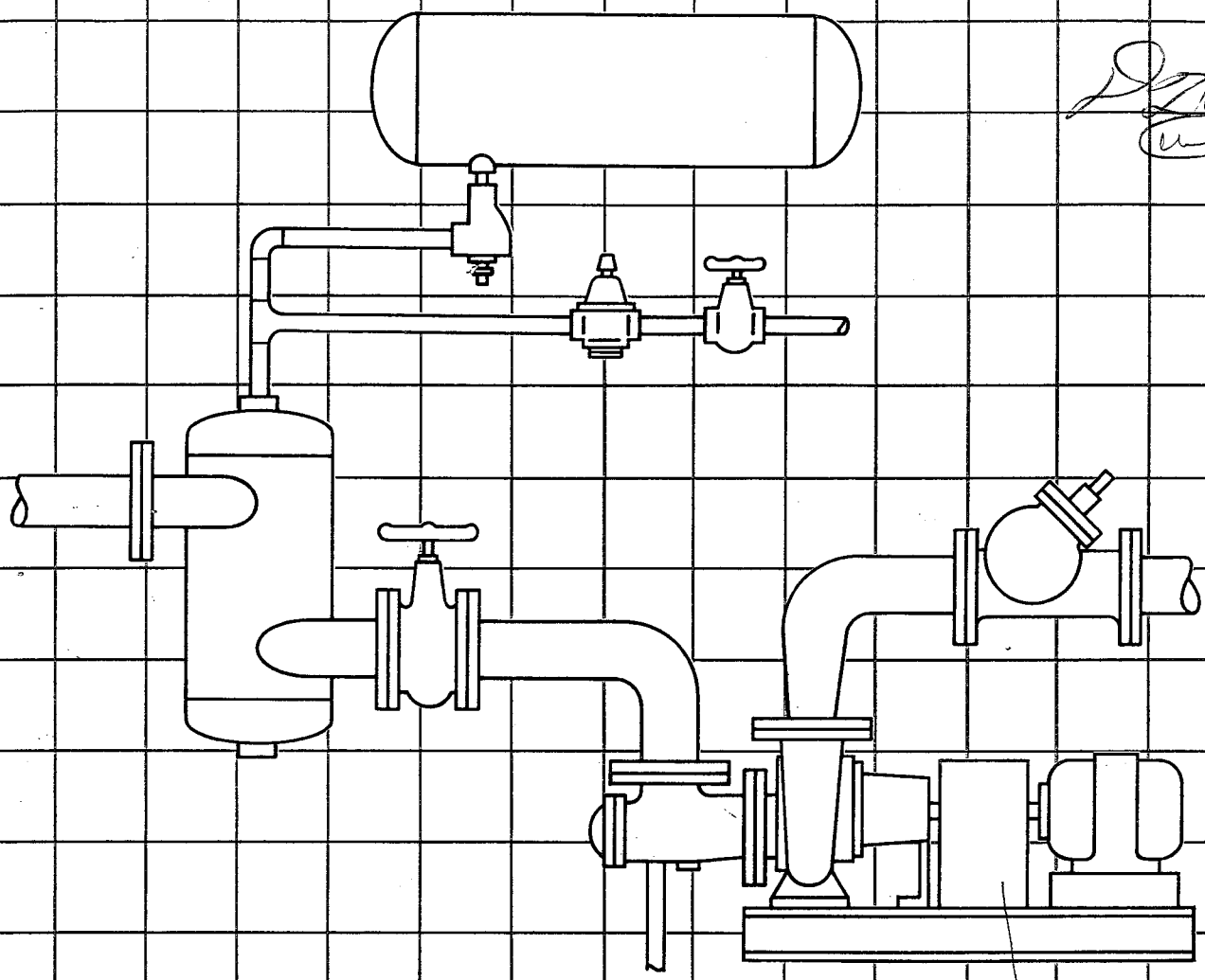
METHODS

By using equipment name plate data listed in the Test and Balance report, chilled water system temperature and pressure readings, etc., the current cooling load was determined and compared with the chiller plant equipment capacities to determine if adequate. Pump data obtained from the T&B reports were used to determine pump impeller sizes necessary to meet the pump flow rates. Field measurements were used to determine chilled water coil installation requirements. Coil was sized using manufacturer computer software.

RESULTS AND CONCLUSIONS

LDCC chiller plant does have adequate capacity to serve both LDCC and CCF cooling loads. The evaporative media in air handler EC-1 can be replaced with a 4-row cooling coil and casing. The cooling coil will have to be knocked down and rebuilt inside the fan housing because it won't fit otherwise. Chilled water pump impellers can be increased in size by replacing the entire rotating elements of the pumps. The air handling unit EC-1 fans do not have anyway currently to keep air from reversing itself through the standby fans. Adding backdraft dampers to each of the four fans will not work because of space constraints in the air handling unit. Therefore the fan inlet cones will be replaced with new inlet cones that have built-in inlet vanes for damper control.

3442.053.MCAL.005 1 4
Rev 0



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- *The time proven method of air control for hydronic systems.*
- *A complete line of air control components.*
- *Guaranteed to prevent the accumulation of air in heating and cooling units.*
- *Twenty year product warranty.*

ITT Bell & Gossett
ITT Fluid Technology Corporation

THE ROLAIRTROL® AIR SEPARATOR

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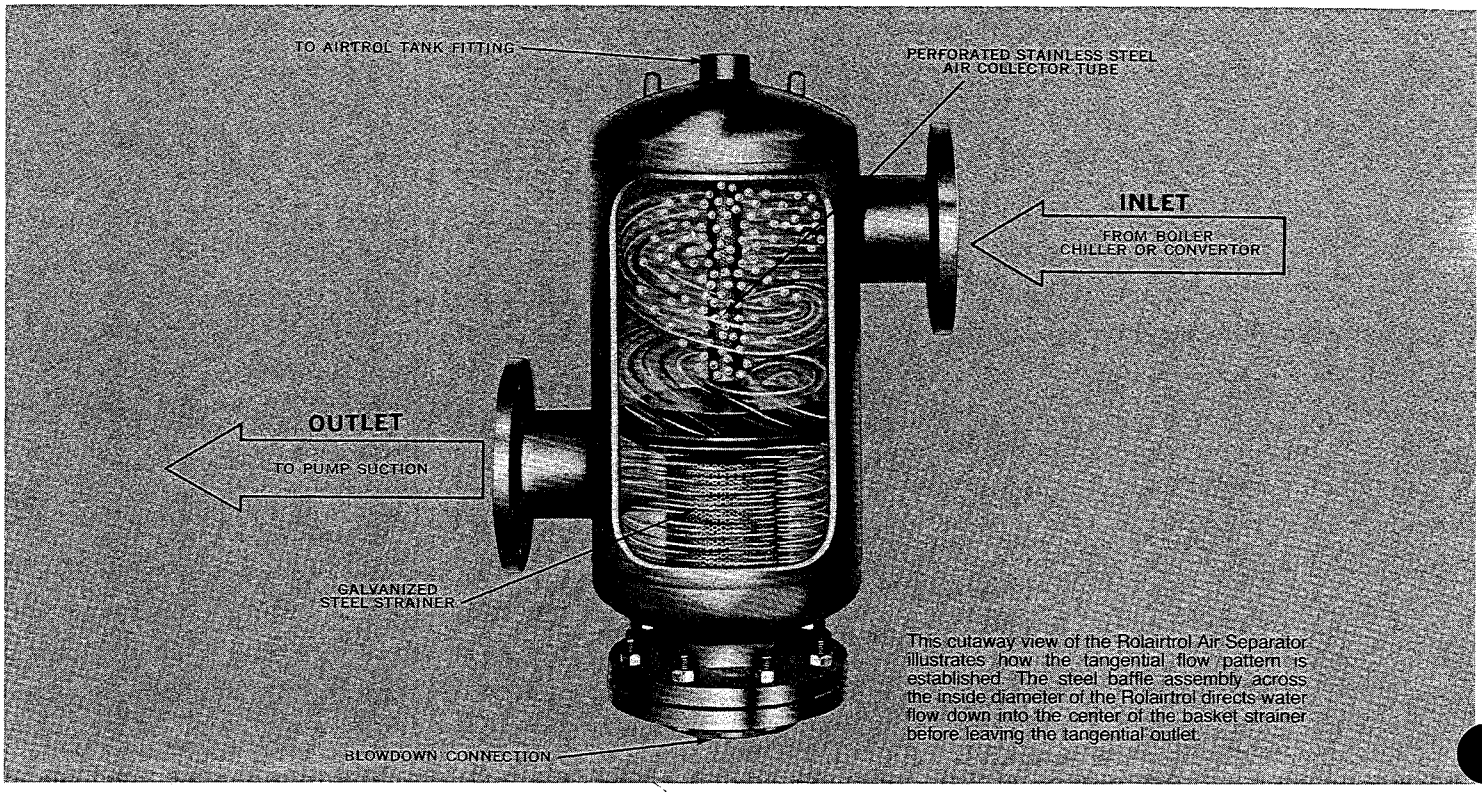
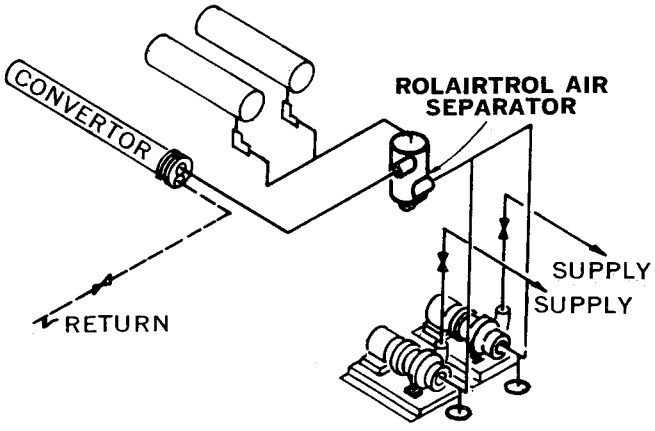
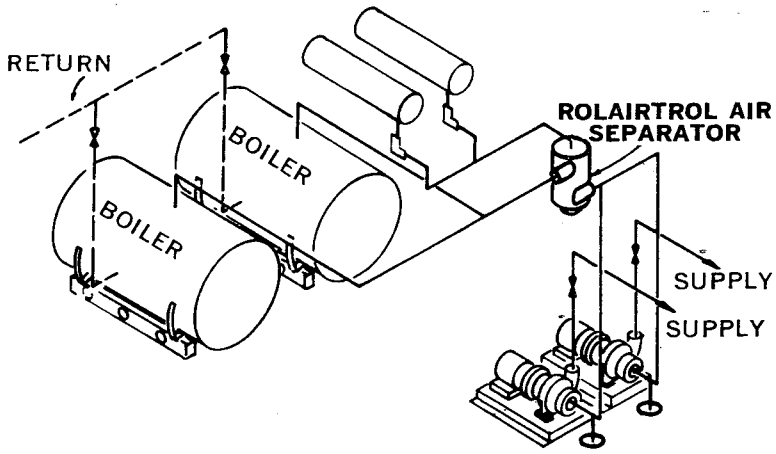


This cutaway view of the Rolairtrol Air Separator illustrates how the tangential flow pattern is established. The steel baffle assembly across the inside diameter of the Rolairtrol directs water flow down into the center of the basket strainer before leaving the tangential outlet.



CONVERTOR SYSTEM WITH ZONE PUMPS



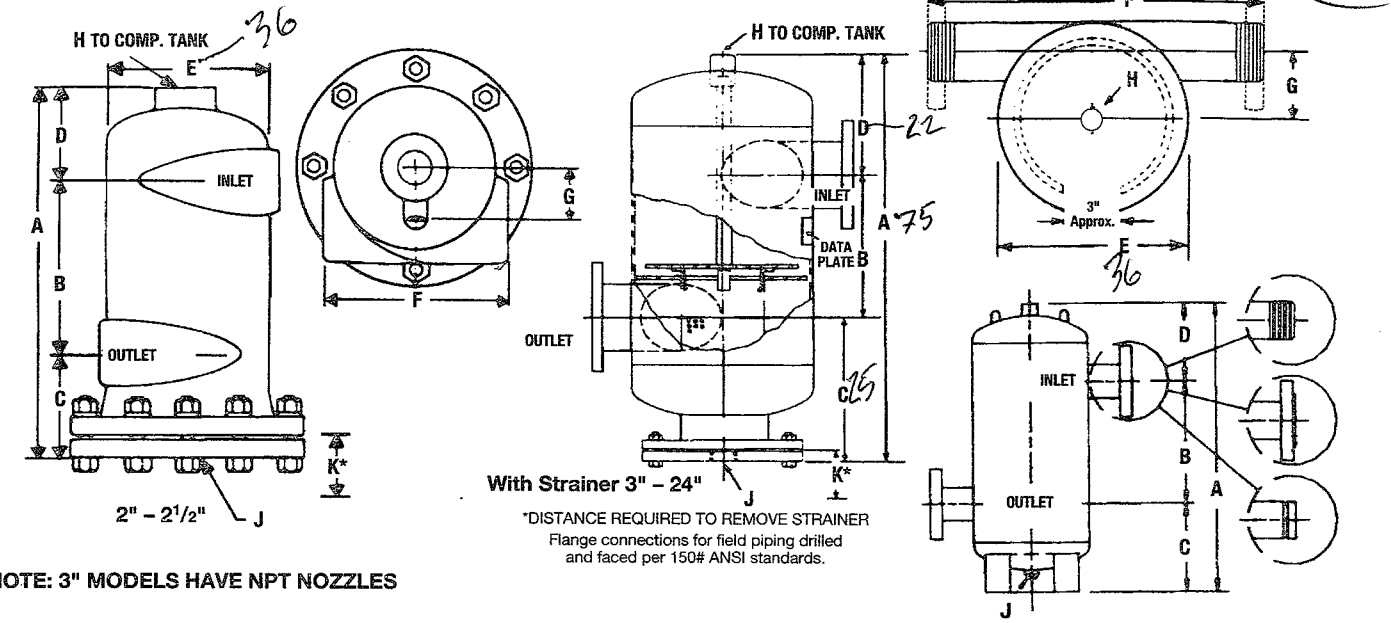
MULTIPLE BOILER WITH ZONE PUMPS

Typical installation for both boiler and convertor applications shows Rolairtrol Air Separator installed so that system strainer is always accessible for cleaning. Note system pump always operates away from Rolairtrol Air Separator.

The Rolairtrol Air Separator provides effective separation of free air from the system fluid thru its unique design and tangential nozzles which work together to create a low velocity vortex around the stainless steel air collector tube. The action of centrifugal forces causes heavier bubble free water to move to the outside while the lighter air entrained water moves into the low velocity area at the center. Physical size is reduced considerably over conventional low velocity separators. Models with removable system strainer require installation so that the strainer is always accessible for cleaning. Strainers should always be removed and cleaned after 24 hours and 30 days of system operation. Any system strainer should be checked regularly.

THE ROLAIRTROL AIR SEPARATOR (Air Control)

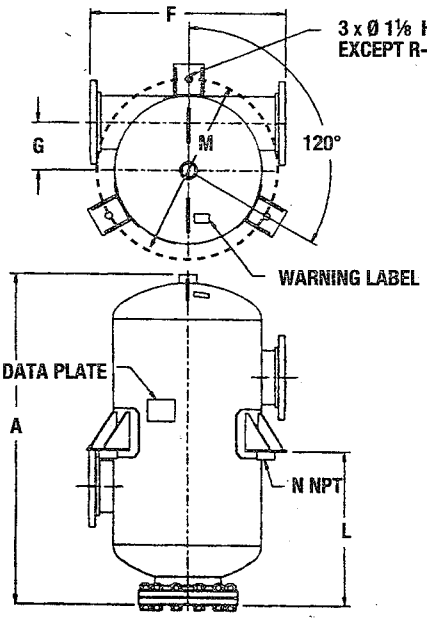
DIMENSIONS & WEIGHTS



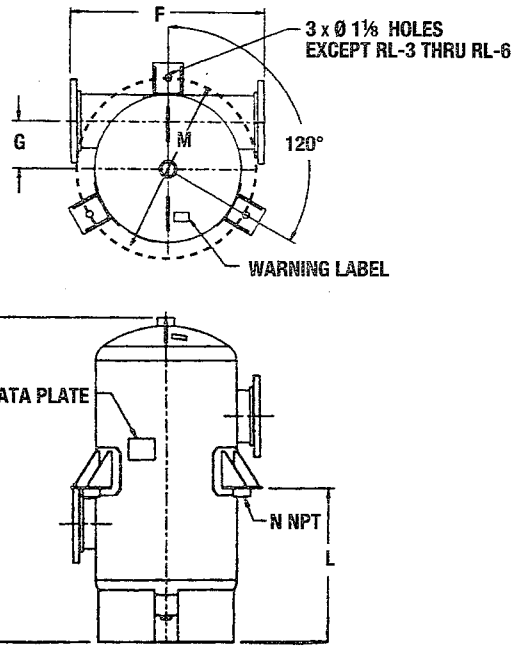
*DISTANCE REQUIRED TO REMOVE STRAINER

Flange connections for field piping drilled and faced per 150# ANSI standards.

NOTE: 3" MODELS HAVE NPT NOZZLES



3"-24" MODEL WITH STRAINER AND OPTIONAL BRACKET SUPPORTS



3"-24" MODEL LESS STRAINER AND OPTIONAL BRACKET SUPPORTS

SUPPORT NOTES

1. Model "R" Rolairtrol Air Separators have strainers which must be removed and cleaned after 24 hours operation, 30 days operation and as required to maintain proper system air separation. Before installing the model "R" Rolairtrol, refer to (K) in the dimensions and weights table (page 3), which notes minimum distances to be maintained between the blowdown connection and the floor or other equipment for strainer removal.
2. Rolairtrol sizes through an "R8" or "RL8" can be supported in the piping system as long as pipe hangers are attached to the tangential nozzles as close to the Rolairtrol shell as possible. Sizes larger than an "R8" or "RL8" will need to have additional supports such as a cradle under the Rolairtrol acting on a diameter as close to the Rolairtrol outside diameter as possible, or factory installed clips welded to the shell for overhead hanging, or floor mount support.
3. Lifting lugs are for the transportation and installation of the empty vessel, and are not to be used for complete or partial support of the flooded vessel.
4. The RL skirt can support flooded vessel weight, but an R model bottom flange (strainer housing) cannot support the flooded weight of the vessel.
5. Welding to the pressure vessel boundary will void the ASME stamp.

MODEL NUMBERING

RL - 12 G B

- (B for bracket support, blank if without)
- Connection (F = flange, G = grooved, N = NPT)
- Size (2"-24") 10 12
- Model "R" (with strainer)
- Model "RL" (less strainer)

3442.053.MCAL.005 Rev0 7

CAPACITIES, DIMENSIONS & WEIGHTS* – ENGLISH (METRIC)

NOTE: These dimensions and weights are approximate. For certified dimensions and weights, contact the factory.

Model No.	Capacity GPM (M^3/Hr)	Size of Tangential Openings		DIMENSIONS IN INCHES (mm) A	B	C	D	E	F	Grooved F	G	H	J	K
R-2	56 (12.7)	2	NPT	15 7/8 (403.2)	7 (177.8)	4 (101.6)	4 7/8 (123.8)	6 5/8 (168.3)	7 3/8 (187.3)	–	2 (50.8)	1 (25.4)	1 (25.4)	8 1/2 (215.9)
R-2 1/2	90 (20.4)	2 1/2	NPT	17 3/8 (441.3)	7 1/2 (190.5)	4 1/2 (114.3)	5 3/8 (136.5)	8 3/8 (212.7)	9 3/4 (247.7)	–	2 5/8 (66.7)			
R-3	190 (43.2)	3	FLG, NPT or Grv'd	25 11/16 (652.5)	8 (203.2)	9 5/8 (244.5)	8 1/16 (204.8)	10 3/4 (273.1)	16 3/4 (425.5)	16 3/4 (425.5)	3 11/16 (93.7)	1 1/4 (31.8)	1 1/2 (38.1)	12 (304.8)
R-4	300 (68.1)	4	Flanged or Grooved	30 3/4 (781.1)	10(254.0)	11 1/4 (285.8)	9 1/2 (241.3)	12 3/4 (323.9)	20 1/2 (520.7)	19 3/4 (501.7)	4 1/8 (104.8)	1 1/2 (38.1)		14 (355.6)
R-5	500 (113.6)	5		36 1/8 (917.6)	12 (304.8)	13 3/16 (335.0)	10 15/16 (277.8)	16 (406.4)	23 3/4 (603.3)	23 (584.2)	5 1/4 (133.4)			17 (431.8)
R-6	700 (159.0)	6		42 3/4 (1,085.9)	14 (355.6)	15 1/2 (393.7)	13 1/4 (336.6)	18 (457.2)	25 3/4 (654.1)	25 (635.0)	5 11/16 (144.5)			20 (508.0)
R-8	1,300 (295.2)	8		53 13/16 (1,366.8)	18 (457.2)	19 1/4 (489.0)	16 9/16 (420.7)	24 (609.6)	31 3/4 (806.5)	31 (787.4)	7 11/16 (195.3)	2 (50.8)		23 (584.2)
R-10	2,000 (454.2)	10		64 5/8 (1,641.5)	22 (558.8)	22 9/16 (573.1)	20 1/16 (509.6)	30 (762.0)	37 3/4 (958.9)	37 3/4 (958.9)	9 5/8 (244.5)			29 (736.6)
R-12	2,750 (624.5)	12		77 (1,955.8)	27 (685.8)	27 1/16 (695.3)	22 1/4 (574.4)	36 (914.4)	46 3/4 (1,187.5)	46 3/4 (1,187.5)	11 5/8 (295.3)			34 (863.6)
R-14	3,400 (772.1)	14		89 7/8 (2,282.8)	31 1/2 (800.1)	32 1/2 (825.5)	25 7/8 (657.2)	42 (1,066.8)	54 1/2 (1,384.3)	54 1/2 (1,384.3)	14 (355.6)		2 (50.8)	37 (939.8)
R-16	4,400 (999.2)	16		102 3/4 (2,609.9)	36 (914.4)	36 1/2 (927.1)	30 1/4 (768.4)	48 (1,219.2)	62 1/2 (1,587.5)	62 1/2 (1,587.5)	16 (406.4)			42 (1,066.8)
R-18	5,200 (1,180.9)	18		123 (3,124.2)	40 1/2 (1,028.7)	44 3/4 (1,136.7)	37 3/4 (958.9)	54 (1,371.6)	70 1/4 (1,784.4)	70 1/4 (1,784.4)	18 (457.2)			52 (1,320.8)
R-20	6,300 (1,430.7)	20		135 7/8 (3,451.2)	45 (1,143.0)	49 1/8 (1,247.8)	41 3/4 (1,060.5)	60 (1,524.0)	78 (1,981.2)	78 (1.981.2)	20 (508.0)			56 (1,422.4)
R-22	7,400 (1,680.5)	22		148 1/16 (3,762.4)	49 5/8 (1,260.5)	52 3/4 (1,339.9)	45 3/4 (1,162.1)	66 (1,676.4)	85 7/8 (2,181.2)	85 7/8 (2,181.2)	22 (558.8)			60 (1,524.0)
R-24	8,500 (1,930.4)	24		159 5/8 (4,048.1)	54 (1,371.6)	56 1/8 (1,425.6)	49 1/4 (1,251.0)	72 (1,828.8)	93 1/2 (2,374.9)	93 1/2 (2,374.9)	24 (609.6)			64 (1,625.6)
RL-2	56 (12.7)	2	NPT	15 7/8 (403.2)	7 (177.8)	4 (101.6)	4 7/8 (123.8)	6 5/8 (168.3)	7 3/8 (187.3)	–	2 (50.8)	1 (25.4)		
RL-2 1/2	90 (20.4)	2 1/2	NPT	17 3/8 (441.3)	7 1/2 (190.5)	4 1/2 (114.3)	5 3/8 (136.5)	8 3/8 (212.7)	9 3/4 (247.7)	–	2 5/8 (66.7)			
RL-3	190 (43.2)	3	FLG, NPT or Grv'd	26 7/8 (682.8)	8 (203.2)	10 13/16 (274.6)	8 1/16 (204.8)	10 3/4 (273.1)	16 3/4 (425.5)	16 3/4 (425.5)	3 11/16 (93.7)	1 1/4 (31.8)		
RL-4	300 (68.1)	4	Flanged or Grooved	31 7/16 (798.6)	10 (254.0)	12 (304.8)	9 7/16 (239.7)	12 3/4 (323.9)	20 1/2 (520.7)	19 3/4 (501.7)	4 1/8 (104.8)	1 1/2 (38.1)		
RL-5	530 (120.4)	5		37 (939.8)	12 (304.8)	14 (355.6)	11 (279.4)	16 (406.4)	23 3/4 (603.3)	23 (584.2)	5 1/4 (133.4)			
RL-6	850 (193.0)	6		44 1/16 (1,119.1)	14 (355.6)	16 13/16 (427.0)	13 1/4 (336.3)	18 (457.2)	25 3/4 (654.1)	25 (635.0)	5 11/16 (144.5)			
RL-8	1,900 (431.5)	8		54 1/2 (1,384.3)	18 (457.2)	20 (508.0)	16 1/2 (419.1)	24 (609.6)	31 3/4 (806.5)	31 (787.4)	7 11/16 (195.3)	2 (50.8)		
RL-10	3,600 (817.6)	10		64 11/16 (1,643.1)	22 (558.8)	22 3/4 (577.9)	19 15/16 (506.4)	30 (762.0)	37 3/4 (958.9)	37 3/4 (958.9)	9 5/8 (244.5)		1 (25.4)	N/A
RL-12	4,800 (1,090.1)	12		75 3/8 (1,914.7)	27 (685.8)	25 3/4 (654.1)	22 3/8 (574.8)	36 (914.4)	46 3/4 (1,187.5)	46 3/4 (1,187.5)	11 5/8 (295.3)			
RL-14	6,100 (1,385.3)	14		95 (2,413.0)	31 1/2 (800.1)	35 (889.0)	28 1/2 (723.9)	42 (1,066.8)	54 1/2 (1,384.3)	54 1/2 (1,384.3)	14 (355.6)			
RL-16	8,000 (1,816.8)	16		105 3/4 (2,686.1)	36 (914.4)	38 1/8 (968.5)	31 1/8 (803.4)	48 (1,219.2)	62 1/2 (1,587.5)	62 1/2 (1,587.5)	16 (406.4)	2 (50.8)		
RL-18	9,700 (2,202.9)	18		123 (3,124.2)	40 1/2 (1,028.7)	44 3/4 (1,136.7)	37 3/4 (958.9)	54 (1,371.6)	70 1/4 (1,784.4)	70 1/4 (1,784.4)	18 (457.2)			
RL-20	12,000 (2,725.2)	20		135 7/8 (3,438.5)	45 (1,143.0)	48 5/8 (1,235.2)	41 3/4 (1,060.5)	60 (1,524.0)	78 (1,961.2)	78 (1,981.2)	20 (508.0)			
RL-22	15,000 (3,406.5)	22		148 (3,759.2)	49 3/8 (1,260.5)	52 5/8 (1,336.8)	45 3/4 (1,162.1)	66 (1,676.4)	85 7/8 (2,182.2)	85 7/8 (2,182.2)	22 (558.8)			
RL-24	17,000 (3,860.7)	24		159 3/8 (4,048.1)	54 (1,371.6)	56 1/8 (1,425.6)	49 1/4 (1,251.0)	72 (1,828.8)	93 1/2 (2,374.9)	93 1/2 (2,374.9)	24 (609.6)			

Model No.	Capacity GPM (M^3/Hr)	Size of Tangential Openings		DIMENSIONS IN INCHES (mm) L	M	N	Cv	Strainer Free Area in Sq. Inches (mm^2)	Weight of Brackets in Lbs. (Kg)	Approx. Volume in Gallons (Ltr.)	Approx. Shpg.Wt. in. Lbs. (Kg)	Flood Wt. Less Bracket in Lbs. (Kg)
R-2	56 (12.7)	2	NPT	N/A	N/A	N/A	44	32 (20,645.1)	N/A	2 (7.6)	55 (25.0)	70 (31.8)
R-2 1/2	90 (20.4)	2 1/2					64	45 (29,032.2)		3 (11.4)	90 (40.9)	115 (52.2)
R-3	190 (43.2)	3	FLG, NPT or Grv'd	12 1/4 (311.2)	14 1/8 (358.8)		80	66 (42,580.6)		7 (26.5)	95 (43.2)	155 (70.3)
R-4	300 (68.1)	4		14 11/16 (373.1)	16 7/8 (409.6)		135	140 (90,322.4)	9 (4.1)	13 (49.2)	165 (75.0)	270 (122.5)
R-5	500 (113.6)	5		17 5/8 (447.7)	19 3/8 (492.1)		215			25 (94.6)	220 (100.0)	425 (192.8)
R-6	700 (159.0)	6		20 13/16 (528.6)	21 3/8 (542.9)	2	305	220 (141,935.2)		34 (128.7)	300 (136.4)	580 (263.1)
R-8	1,300 (295.2)	8		25 5/16 (642.9)	29 1/2 (749.3)		532	310 (199,999.6)	29 (13.2)	90 (340.7)	460 (209.1)	1,215 (551.1)
R-10	2,000 (454.2)	10	Flanged	31 9/16 (801.7)	35 1/2 (901.7)		850	435 (280,644.6)		150 (567.8)	860 (390.9)	2,115 (959.4)
R-12	2,750 (624.5)	12	or	39 1/4 (997.0)	41 1/2 (1,054.1)		1,180	590 (380,644.4)	32 (14.5)	291 (1,101.6)	1,200 (545.5)	3,630 (1,646.6)
R-14	3,400 (772.1)	14	Grooved	40 7/8 (1,038.2)	48 1/2 (1,231.9)		1,445	715 (461,289.4)	56 (25.4)	506 (1,915.4)	1,780 (809.1)	6,000 (2,721.6)
R-16	4,400 (999.2)	16		49 (1,244.6)	54 1/2 (1.384.3)	3	1,885	919 (592,902.0)		764 (2,892.0)	2,425 (1,102.3)	8,800 (3,991.7)
R-18	5,200 (1,180.9)	18		61 5/8 (1,565.3)	60 5/8 (1,539.9)		2,340	1,521 (981,288.4)	63 (28.6)	1,173 (4,440.3)	3,410 (1,550.0)	13,200 (5,987.5)
R-20	6,300 (1,430.7)	20		68 3/4 (1,743.1)	66 3/4 (1,695.5)		2,945	1,989 (1,283,223.2)	78 (35.4)	1,647 (6,234.6)	5,310 (2,413.6)	19,055 (8,643.4)
R-22	7,400 (1,680.5)	22		74 1/8 (1,882.8)	72 3/4 (1,847.9)	4	3,725	2,322 (1,498,061.5)		2,070 (7,835.8)	6,400 (2,909.1)	23,680 (10,741.3)
R-24	8,500 (1,930.4)	24		80 3/8 (2,041.5)	79 (2,006.6)		4,325	2,841 (1,832,899.6)	98 (44.5)	2,639 (9,989.7)	7,530 (3,422.7)	29,560 (13,408.4)
R-2	56 (12.7)	2	NPT	N/A	N/A	N/A	55		N/A	2 (7.6)	50 (22.7)	65 (29.5)
RL-2 1/2	90 (20.4)	2 1/2					80			3 (11.4)	85 (38.6)	110 (49.9)
RL-3	190 (43.2)	3	FLG, NPT or Grv'd	13 3/8 (339.7)	14 1/8 (358.8)		215			7 (26.5)	65 (29.5)	120 (54.4)
RL-4	300 (68.1)	4		15 3/8 (390.5)	16 1/8 (409.6)		370		9 (4.1)	13 (49.2)	100 (45.5)	210 (95.3)
RL-5	530 (120.4)	5		18 1/2 (469.9)	19 3/8 (492.1)		580			25 (94.6)	160 (72.7)	365 (165.6)
RL-6	850 (193.0)	6		22 1/8 (562.0)	21 3/8 (542.9)	2	850			36 (136.3)	205 (93.2)	505 (229.1)
RL-8	1,900 (431.5)	8		26 (660.4)	29 1/2 (479.3)		1,445			87(329.3)	400 (181.8)	1,130 (512.6)
RL-10	3,600 (817.6)	10	Flanged	31 5/8 (803.3)	35 1/2 (901.7)		2,340	N/A	29 (13.2)	162 (613.2)	630 (286.4)	1,985 (900.4)
RL-12	4,800 (1,090.1)	12	or	37 3/8 (955.7)	41 1/2 (1,054.1)		3,300		32 (14.5)	282 (1,067.5)	980 (445.5)	3,335 (1,512.8)
RL-14	6,100 (1,385.3)	14	Grooved	46 (1,168.4)	48 1/2 (1,231.9)		3,900		56 (25.4)	472 (1,786.7)	1,700 (772.7)	5,640 (2,558.3)
RL-16	8,000 (1,816.8)	16		52 (1,320.8)	54 1/2 (1,384.3)	3	5,100			723 (2,736.8)	2,325 (1,056.8)	8,360 (3,792.1)
RL-18	9,700 (2,202.9)	18		61 5/8 (1,565.3)	60 5/8 (1,539.9)		6,410		63 (28.6)	1,149 (4,349.4)	3,275 (1,488.6)	12,875 (5,840.1)
RL-20	12,000 (2,725.2)	20		68 (1,727.2)	66 3/4 (1,695.5)		8,000		78 (35.4)	1,577 (5,969.6)	5,140 (2,336.4)	18,300 (8,300.9)
RL-22	15,000 (3,406.5)	22		73 5/8 (1,870.1)	72 3/4 (1,847.9)	4	10,000			1,958 (7,411.8)	6,190 (2,813.6)	22.530 (10,219.6)
RL-24	17,000 (3,860.7)	24		80 (2,032.0)	79 (2,006.6)		11,700		98 (44.5)	2,463 (9,323.4)	7,465 (3,393.2)	28,020 (12,709.9)

*For 26"-36" sizes, contact factory for capacities, dimensions and weights.

weight = 3367 lbs

3442.053.MCAL.005 Rev0

TYPICAL HYDRONIC HEATING/COOLING APPLICATIONS

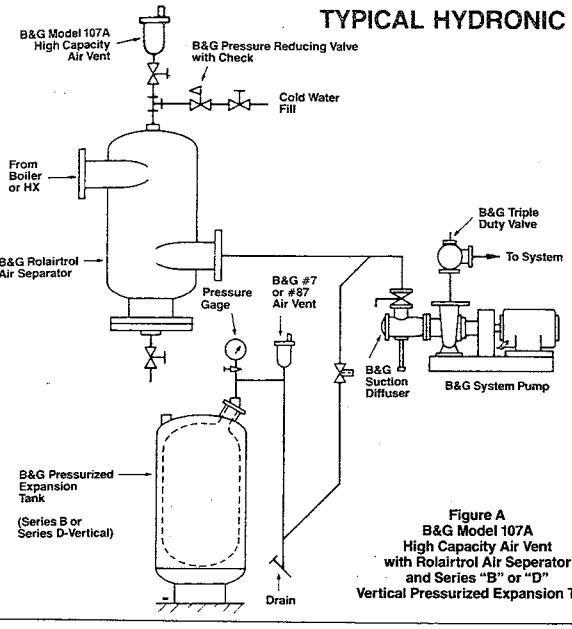


Figure A
B&G Model 107A
High Capacity Air Vent
with Rolairtrol Air Seperator
and Series "B" or "D"
Vertical Pressurized Expansion Tank

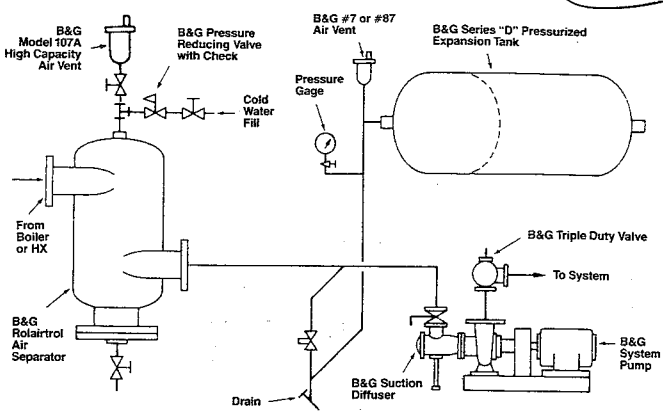


Figure B
B&G Model 107A
High Capacity Air Vent
with Rolairtrol Air Separator
and Series "D"
Horizontal Pressurized Expansion Tank

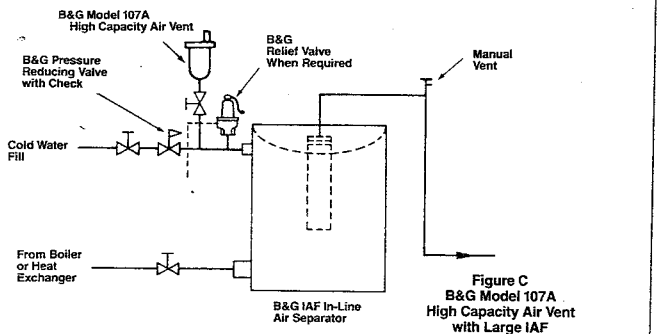


Figure C
B&G Model 107A
High Capacity Air Vent
with Large IAF
In-Line Airtrol Air Separator

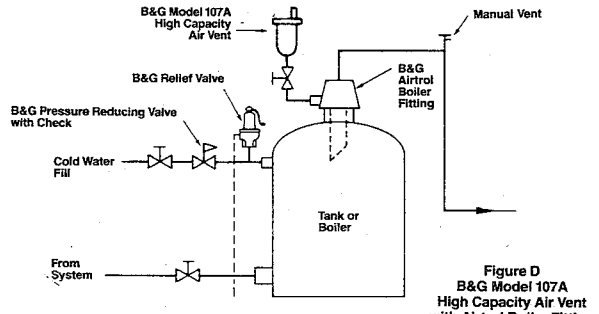
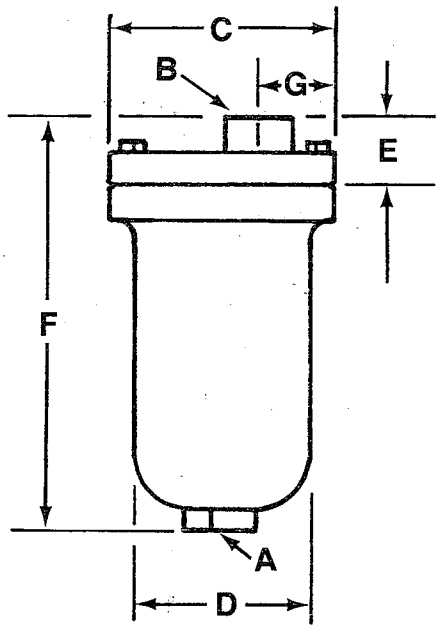


Figure D
B&G Model 107A
High Capacity Air Vent
with Airtrol Boiler Fitting



DIMENSIONS AND WEIGHT

DIMENSIONS								APPROX. SHPG. WT.	
A		B		C		D			
IN	MM	IN	MM	IN	MM	IN	MM	LBS.	KG.
¾	19	⅜	10	4¼	108	4	102		
E		F		G					
IN	MM	IN	MM	IN	MM				
1¾	44	9½	241	1	25			8	3.6

TYPICAL SPECIFICATION

Furnish and install as shown on plans, a float actuated high capacity air vent designed to purge free air from the system and provide shutoff at pressures up to 150 psig at a maximum temperature of 250°F. The design of the high capacity air vent shall prevent air from entering the system if system pressure should drop below atmospheric pressure. The high capacity air vent shall purge free air at pressures up to 150 psig during normal system operation. The high capacity air vent shall be constructed of cast iron and fitted with components of stainless steel, brass, and EPDM.

The high capacity air vent shall be ITT Bell & Gossett Model 107A.

For further information, contact ITT Bell & Gossett, 8200 N. Austin Avenue, Morton Grove, IL 60053,
Phone: (708) 966-3700 — Facsimile (708) 966-9052.

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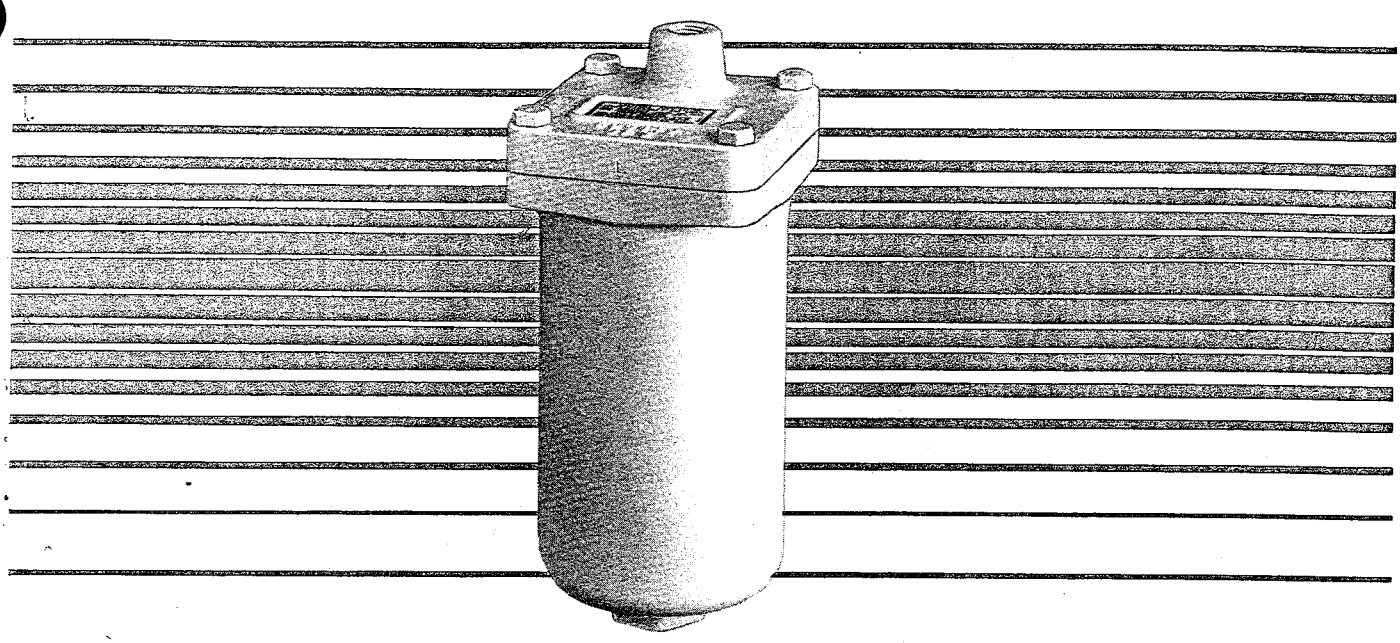


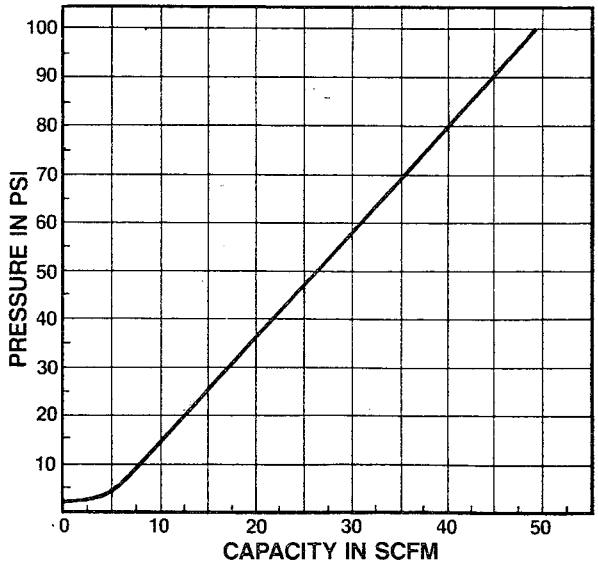
Model 107A High Capacity Air Vent

Bell & Gossett's new float operated high capacity air vent is designed to purge free air from liquid systems at temperatures up to 250°F and pressures up to 150 psig, and provide positive shutoff to eliminate the untimely loss of system liquid. Excellent choice for use in systems using water or ethylene glycol & water as the fluid medium.

The Model 107A High Capacity Air Vent features:

- Float actuated operation for the instant venting of free air at pressures up to 150 psig.
- Rugged cast iron construction with stainless steel, brass and EPDM internal components.
- Positive shutoff at pressures up to 150 psig.

PERFORMANCE CHARACTERISTICS



OPERATING PRINCIPLE

The accumulation of air in the body of the Model 107A High Capacity Air Vent causes a float to drop allowing the air to be vented through the seat. As the liquid level rises, the float also rises, the rubber button closes off the seat stopping the flow of air and preventing the flow of liquid. If system pressure should drop below atmospheric pressure, a small stainless steel ball blocks the orifice, preventing outside air from entering the system.

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3442.053.MCAL.005
Rev 0

7 of 12 10
PZW

Boyd Engineering Supply Co.

FAX

Date: 10-4-01

Number of pages including cover sheet: 3

To: B + P

Attn: DAVID

Phone:

Fax phone:

From: SCOTT NIELSON

Phone: 505-275-1250

Fax phone: 505-275-1193

REMARKS: ☐ Urgent ☑ For your review ☐ Reply ASAP ☐ Please comment

HERE IS YOUR INFO WE DISCUSSED.

THKS,
SCOTT

3442.153.MCAL.005 11/3 Rev

THE BELL & GOSSETT ROLAIRTROL, SUPREME AIR SEPARATION FOR COMMERCIAL SYSTEMS

DESCRIPTION

The Bell & Gossett Rolairtrol is a patented air separator with significant advantages. The Rolairtrol is capable of removing the air that commonly causes problems in commercial hot and chilled water systems. The Rolairtrol provides air free flow, improving efficiency and performance of the HVAC system.

Every aspect of the Rolairtrol design maximizes air separation and simplifies installation and maintenance. The air separation efficiency of the Rolairtrol is significantly higher than any other commercial air separator on the market.

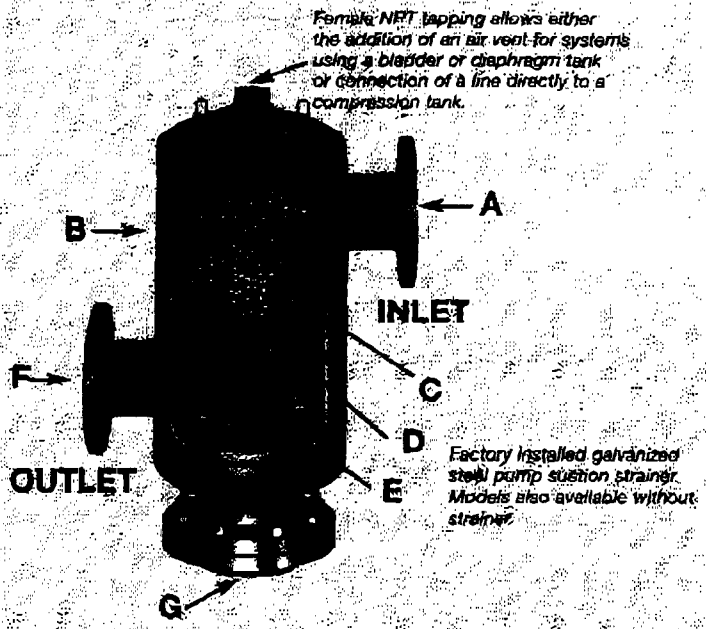
The standard Rolairtrol air separator is constructed to meet ASME code and is stamped for design pressure and temperature ratings of 125 psig (862 kPa) and 350°F (177°C). Higher pressure and temperature models are available.

EPACT 92 IMPACT

As part of the Federal Energy Policy Act of 1992 (known as EPACT 92), effective October 25, 1997, the U.S. Dept. of Energy has established ASHRAE/IESNA Standard 90.1-1989 as the Energy efficiency benchmark for HVAC systems in all new buildings (except low rise residential).

ASHRAE 90.1 has a provision in the form of a clause on building energy transport systems. It states that "energy should be transported by the most efficient means possible and that distribution systems should be selected to complement other system parameters such as control strategies, storage capabilities, conversion, and utilization efficiencies."

How will a B&G Rolairtrol assist a commercial HVAC system meet EPACT 92 requirements? An air bound system is an inefficient energy transfer system. When the B&G Rolairtrol removes entrained air from a commercial HVAC system, it allows the pumps and valves to operate and transport energy more efficiently.



ROLAIRTROL FEATURES	ROLAIRTROL BENEFITS
A Tangential Flow Through Design	**Original B&G Design...Perfected by B&G** – The Rolairtrol provides maximum air separation efficiency due to a combination of centrifugal force and velocity reduction. The Rolairtrol's tangential design creates a whirlpool inside the vessel. This vortex action sends heavier, air-free water to the outer portion of the vessel shell while forcing the separated air into the center where it is drawn to the air collector tube. The tangential design has been proven to have greater air separation efficiency when compared to less effective, straight flow air separators.
B Vessel Shell is 3 Times the Nominal Inlet/Outlet Pipe Diameter	**Original B&G Design...Perfected by B&G** – The vessel shell is at least 3 times the inlet and outlet pipe diameter. This assures maximum velocity reduction in order to develop the highest possible air separation efficiency.
C Stainless Steel Air Collector Tube	**Exclusive B&G Design** – An air collector tube is provided to efficiently gather and centralize the separated air. The separated air is easily directed upwards through the tube and vented in air elimination systems or returned to the compression tank in air control systems.
D Baffle	**Exclusive B&G Design** – The baffle is a barrier between the air-free water and the separated air. It assures that only air-free water is transferred to the outlet connection while separated air is directed to the collector tube.
E Vertical Strainer with Bottom Access	**Exclusive B&G Design** – Unlike the upper, horizontal location of competitive air separators, the Rolairtrol's lower, vertical strainer does not interfere with the vortex action necessary for proper air removal, maximizing efficiency. In addition, the Rolairtrol's strainer is accessible from the bottom of the unit, reducing floor space while simplifying maintenance and clean out of accumulated system debris.
F NPT, Grooved and Flanged Connections	**Exclusive B&G Product Offering** – 3 connection options offer installation flexibility. 2"-3" models are NPT, 3"-12" models are grooved or flanged, and 14"-36" models are flanged.
F Up to 36" Pipe Size Connections	**Exclusive B&G Product Offering** – Models up to 36" in pipe diameter will meet the air separation requirements in the largest HVAC systems.
G Optional B&G Manual Blowdown Valve	**Exclusive B&G Product Offering** – A 1" NPTF manual blowdown valve is available to simplify installation, general maintenance, and remove start-up debris.

3442.153.MCAL.005 Rev C

ROLAIRTROL MATERIALS, OPERATING DATA & AIR ELIMINATION EFF.

CONSTRUCTION MATERIALS

Body - Models R-2, RL-2, R 2½, and RL-2½: Cast iron

Shell - All other models: Steel

System Strainer ("R" Models only): Have galvanized steel strainers with 5/16" (4.8mm) diameter perforations with 51% open area.

Air Collector Tube: Stainless steel with 5/32" (4mm) diameter perforations and 63% open area.

Baffle/Collector Tube Support Assembly: Steel

OPERATING DATA*

Maximum working pressure . . . . . 125 PSIG (862 kPa)
Maximum operating temperature . . . . . 350°F (177°C)

*Higher pressure and temperature ratings are available upon request.

PERFORMANCE DATA*

Model No.	Design Capacity** GPM (m³/hr)	Size of Tangential Openings		Cv	Strainer Free Area in Sq. Inches (mm)²
R-2	56 (12.7)	2	NPT	44	32 (20,645.1)
R-2½	90 (20.4)	2½		64	45 (29,032.2)
R-3***	190 (43.2)	3		80	66 (42,580.6)
R-4(G)	300 (68.1)	4	Flanged or Grooved	135	140 (90,322.4)
R-5(G)	500 (120.4)	5		215	
R-6(G)	700 (159.0)	6		305	220 (141,935.2)
R-8(G)	1,300 (295.2)	8		532	310 (199,999.6)
R-10(G)	2,000 (454.2)	10		850	435 (280,644.6)
R-12(G)	2,750 (624.5)	12		1,180	590 (380,644.4)
R-14(G)	3,400 (772.1)	14	Flanged	1,445	715 (461,289.4)
R-16(G)	4,400 (999.2)	16		1,885	919 (592,902.0)
R-18(G)	5,200 (1,180.9)	18		2,340	1,521 (981,288.4)
R-20(G)	6,300 (1,430.7)	20		2,945	1,989 (1,282,223.2)
R-22(G)	7,400 (1,680.5)	22		3,725	2,322 (1,498,061.5)
R-24(G)	8,500 (1,930.4)	24		4,325	2,841 (1,832,899.6)
RL-2	56 (12.7)	2	NPT	55	N/A
RL-2½	90 (20.4)	2½		80	
RL-3***	190 (43.2)	3		215	
RL-4(G)	300 (68.1)	4	Flanged or Grooved	370	
RL-5(G)	530 (120.4)	5		580	
RL-6(G)	850 (193.0)	6		850	
RL-8(G)	1,900 (431.5)	8		1,445	
RL-10(G)	3,600 (817.6)	10		2,340	
RL-12(G)	4,800 (1,090.1)	12		3,300	
RL-14(G)	6,100 (1,385.3)	14	Flanged	3,900	
RL-16(G)	8,000 (1,861.8)	16		5,100	
RL-18(G)	9,700 (2,202.9)	18		6,410	
RL-20(G)	12,000 (2,725.2)	20		8,000	
RL-22(G)	15,000 (3,406.5)	22		10,000	
RL-24(G)	17,000 (3,860.7)	24		11,700	

For 26"-36" sizes, performance data is available upon request.
**Recommended design capacity at 40% first pass air elimination efficiency.
***Flanged and grooved connections are also available for the 3" Rolairtrol.
For approximate dimensions, see B&G Rolairtrol Submittal A-326G.

AIR ELIMINATION EFFICIENCY

To find the first pass air elimination percentage of any Rolairtrol size, perform the following steps:

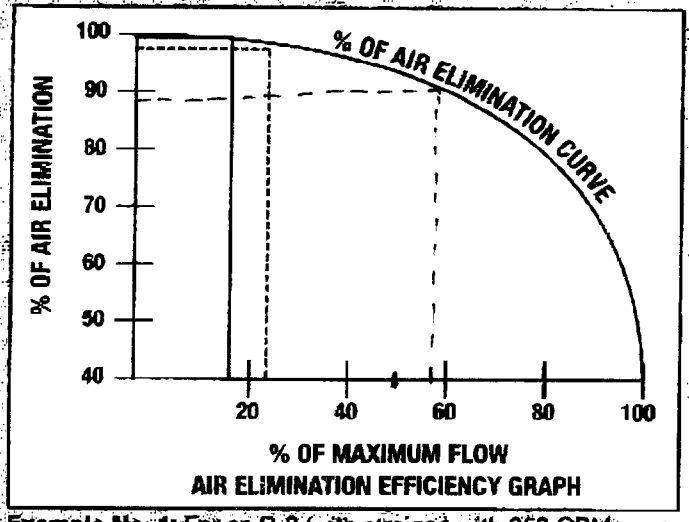
A. Determine actual system flow rate.

B. Find the maximum capacity of the Rolairtrol model (see Performance Data, below, left)

C. Use A & B in the following formula –

$$\frac{A}{B} \times 100 = \%\ \text{OF MAXIMUM FLOW}$$

D. Draw a vertical line from the x-axis on the Air Elimination Efficiency Graph to the % air elimination curve line and find the percentage of air elimination.



AIR ELIMINATION EFFICIENCY GRAPH

Example No. 1: For an R-8 (with strainer) with 350 GPM passing through it, the percentage of maximum flow would be *(BROKEN RED LINE ABOVE)*:

$$\frac{350}{1,300} \times 100 = 26.92\%$$

At this % of maximum flow the R-8 will separate 97.5% of the entrained air on each pass through the unit. The pressure drop through the unit with a clean strainer would be 1.0 feet (see page 5).

Example No. 2: For an RL-8 (less strainer) with 350 GPM passing through it, the percentage of maximum flow would be *(SOLID RED LINE ABOVE)*:

$$\frac{350}{1,900} \times 100 = 18.42\%$$

At this % of maximum flow the R-8 will separate 98.5% of the entrained air on each pass through the unit. The pressure drop through the unit with a clean strainer would be 0.14 feet (see page 5).

ROLAIRTROL MANUAL BLOWDOWN VALVE ACCESSORY MODEL MBV-1

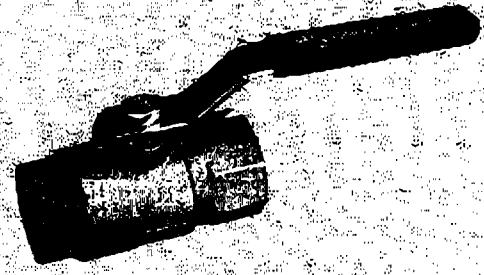
The MBV-1 facilitates routine manual purging of system debris collected at the bottom of the separator. See B&G MBV-1 Submittal A-329 for more details.

MBV-1 CONSTRUCTION MATERIAL

Body: NPTF Bronze — Seal: Reinforced PTFE
Ball: Chrome Plated Brass — Packing: PTFE

MBV-1 OPERATING DATA

Maximum working pressure . . . . . 300 PSIG (2069 kPa)
Maximum operating temperature . . . . . 250°F (121°C)



BELL & GOSSETT

To: B+P
ATTN: DAVED WALKER
3442.053.MCAL.005 Rev 0

13

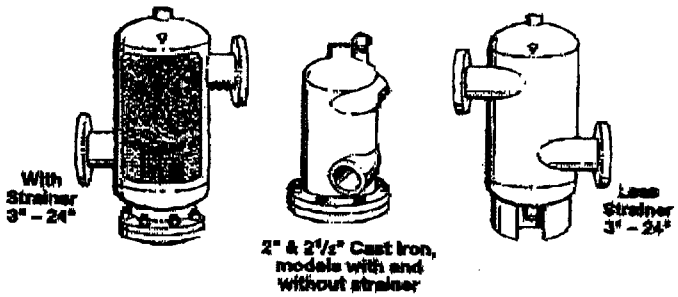
SUBMITTAL

A-326H

JOB: L.A.N.L. **REPRESENTATIVE:** BOYD ENGINEERING SUPPLY CO.

ENGINEER: BRIDGERS & PAXTON **CONTRACTOR:**

TAG: **DATE:** 06/25/02 **SUBMITTED BY:** SCOTT NIELSON



The ROLAIRTROL® Air Separator

Air Control and Elimination

DESCRIPTION

The Rolairtrol Air Separator is an ASME vessel designed with tangential openings to create a low velocity vortex where air is separated and removed from the circulating water.

MAXIMUM WORKING PRESSURE

125 PSIG (862 kPa)

MAXIMUM OPERATING TEMPERATURE

350°F (177°C)

CONSTRUCTION

- Designed and constructed per ASME Section VIII, Division I.
- Body – Models R-2, RL-2; R-2½, and RL-2½: Cast Iron.
- Shell – All other models: Steel.
- System Strainer ("R" Models only): Have galvanized steel strainers with 3/16" (4.8mm) diameter perforations with 51% open area.
- Air Collector Tube: Stainless steel with 5/32" (4mm) diameter perforations and 63% open area.
- Baffle/Collector Tube Support Assembly: Steel
- Bottom Reducing Flange Gasket ("R" models only): Arimide fiber.

SCHEDULE AND PERFORMANCE CHARACTERISTICS*

MODEL NO. & CAPACITY				SIZE OF TANGENTIAL OPENINGS INCHES		TAGGING INFORMATION	QUANTITY
WITH STRAINER		LESS STRAINER					
MODEL NO.**	GPM (M³/Hr)	MODEL NO.	GPM (M³/Hr)				
R-2N	58 (12.7)	RL-2N	58 (12.7)	2	NPT		
R-2½N	90 (20.4)	RL-2½N	90 (20.4)	2½			
R-3(N,F or G)(B)	190 (43.2)	RL-3(N,F or G)(B)	190 (43.2)	3	NPT, Flanged or Grooved		
R-4(F or G)(B)	300 (68.1)	RL-4(F or G)(B)	300 (68.1)	4			
R-5(F or G)(B)	500 (113.6)	RL-5(F or G)(B)	530 (120.4)	5			
R-6(F or G)(B)	700 (159.0)	RL-6(F or G)(B)	850 (193.0)	6			
R-8(F or G)(B)	1,300 (295.2)	RL-8(F or G)(B)	1,900 (431.5)	8			
R-10(F or G)(B)	2,000 (454.2)	RL-10(F or G)(B)	3,600 (817.6)	10			
R-12(F or G)(B)	2,750 (624.5)	RL-12(F or G)(B)	4,800 (1,090.1)	12	Flanged or Grooved		
R-14(F or G)(B)	3,400 (772.1)	RL-14(F or G)(B)	6,100 (1,385.3)	14			
R-16(F or G)(B)	4,400 (999.2)	RL-16(F or G)(B)	8,000 (1,816.8)	16			
R-18(F or G)(B)	5,200 (1,180.9)	RL-18(F or G)(B)	9,700 (2,202.9)	18			
R-20(F or G)(B)	6,300 (1,430.7)	RL-20(F or G)(B)	12,000 (2,725.2)	20			
R-22(F or G)(B)	7,400 (1,680.5)	RL-22(F or G)(B)	15,000 (3,406.5)	22			
R-24(F or G)(B)	8,500 (1,930.4)	RL-24(F or G)(B)	17,000 (3,860.7)	24			

*For 26"-36" sizes contact factory for performance characteristics.
**The Rolairtrol Air Separator must be selected with a connection type (N for NPT, F for flanged, G for grooved). If bracket supports are desired, add B at the end of the model number.

Bell & Gossett

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CAPACITIES, DIMENSIONS & WEIGHTS* – ENGLISH (METRIC)

NOTE: These dimensions and weights are approximate. For certified dimensions and weights, contact the factory.

Model No.	Capacity GPM (M^3/Hr)	Size of Tangential Openings		DIMENSIONS IN INCHES (mm) A	B	C	D	E	F	Grooved F	G	H	J	K
R-2	56 (12.7)	2	NPT	15 7/8 (403.2)	7 (177.8)	4 (101.6)	4 7/8 (123.8)	6 5/8 (168.3)	7 3/8 (187.3)	–	2 (50.8)	1 (25.4)	1 (25.4)	8 1/2 (215.9)
R-2 1/2	90 (20.4)	2 1/2	NPT	17 3/8 (441.3)	7 1/2 (190.5)	4 1/2 (114.3)	5 3/8 (136.5)	8 3/8 (212.7)	9 3/4 (247.7)	–	2 5/8 (66.7)			
R-3	190 (43.2)	3	NPT	25 11/16 (652.5)	8 (203.2)	9 5/8 (244.5)	8 1/16 (204.8)	10 3/4 (273.1)	16 3/4 (425.5)	–	3 11/16 (93.7)	1 1/4 (31.8)	1 1/2 (38.1)	12 (304.8)
R-3	190 (43.2)	3	FLG or Grv'd	25 11/16 (652.5)	8 (203.2)	9 5/8 (244.5)	8 1/16 (204.8)	10 3/4 (273.1)	22 3/4 (577.9)	16 3/4 (425.5)	3 5/8 (92.1)	1 1/4 (31.8)	1 1/2 (38.1)	12 (304.8)
R-4	300 (68.1)	4	Flanged or Grooved	30 7/8 (781.1)	10 (254.0)	11 1/4 (285.8)	9 1/2 (241.3)	12 3/4 (323.9)	20 1/2 (520.7)	19 3/4 (501.7)	4 1/8 (104.8)	1 1/2 (38.1)	2 (50.8)	14 (355.6)
R-5	500 (113.6)	5		38 1/2 (917.6)	12 (304.8)	13 3/16 (335.0)	10 15/16 (277.8)	18 (408.4)	23 3/4 (603.3)	23 (584.2)	5 1/4 (133.4)			17 (431.8)
R-6	700 (159.0)	6		42 3/4 (1,085.9)	14 (355.6)	15 1/2 (393.7)	13 1/4 (336.6)	18 (457.2)	25 3/8 (654.1)	25 (635.0)	5 11/16 (144.5)			20 (508.0)
R-8	1,300 (295.2)	8		53 13/16 (1,368.6)	18 (457.2)	18 1/4 (469.0)	16 9/16 (420.7)	24 (609.6)	31 3/4 (806.5)	31 (787.4)	7 11/16 (195.3)			23 (584.7)
R-10	2,000 (454.2)	10		64 5/8 (1,641.5)	22 (558.8)	22 9/16 (573.1)	20 1/16 (509.6)	30 (762.0)	37 3/4 (958.9)	37 3/4 (958.9)	9 5/8 (244.5)			29 (736.6)
R-12	2,750 (624.5)	12		77 (1,955.8)	27 (685.8)	27 3/8 (695.3)	22 5/8 (574.4)	36 (914.4)	45 3/8 (1,187.5)	46 3/4 (1,187.5)	11 5/8 (295.3)			34 (863.6)
R-14	3,400 (772.1)	14		89 7/8 (2,282.8)	31 1/2 (800.1)	32 1/2 (825.5)	25 7/8 (657.2)	42 (1,066.8)	54 1/2 (1,384.3)	54 1/2 (1,384.3)	14 (355.6)			37 (939.8)
R-16	4,400 (999.2)	16		102 3/8 (2,600.9)	36 (914.4)	36 1/2 (927.1)	30 1/4 (768.4)	48 (1,219.2)	62 1/2 (1,587.5)	62 1/2 (1,587.5)	16 (406.4)			42 (1,066.8)
R-18	5,200 (1,180.9)	18		123 (3,124.2)	40 1/2 (1,028.7)	44 3/4 (1,136.7)	37 3/4 (958.9)	54 (1,371.6)	70 1/4 (1,784.4)	70 1/4 (1,784.4)	18 (457.2)			52 (1,320.8)
R-20	6,300 (1,430.7)	20		135 7/8 (3,451.2)	45 (1,143.0)	49 1/8 (1,247.8)	41 3/4 (1,060.5)	60 (1,524.0)	78 (1,981.2)	78 (1,981.2)	20 (508.0)			56 (1,422.4)
R-22	7,400 (1,680.5)	22		148 1/8 (3,762.4)	49 3/4 (1,260.5)	52 3/4 (1,339.9)	45 3/4 (1,162.1)	66 (1,676.4)	85 7/8 (2,181.2)	85 7/8 (2,181.2)	22 (558.8)			60 (1,524.0)
R-24	8,500 (1,930.4)	24		159 5/8 (4,048.1)	54 (1,371.6)	56 1/8 (1,425.6)	49 1/4 (1,251.0)	72 (1,828.8)	93 1/2 (2,374.9)	93 1/2 (2,374.9)	24 (609.6)			64 (1,625.6)
RL-2	56 (12.7)	2	NPT	15 7/8 (403.2)	7 (177.8)	4 (101.6)	4 7/8 (123.8)	6 5/8 (168.3)	7 3/8 (187.3)	–	2 (50.8)	1 (25.4)	1 (25.4)	N/A
RL-2 1/2	90 (20.4)	2 1/2	NPT	17 3/8 (441.3)	7 1/2 (190.5)	4 1/2 (114.3)	5 3/8 (136.5)	8 3/8 (212.7)	9 3/4 (247.7)	–	2 5/8 (66.7)			
RL-3	190 (43.2)	3	NPT	26 7/8 (682.8)	8 (203.2)	10 13/16 (274.6)	8 1/16 (204.8)	10 3/4 (273.1)	16 3/4 (425.5)	–	3 11/16 (93.7)	1 1/4 (31.8)		
RL-3	190 (43.2)	3	FLG or Grv'd	26 7/8 (682.8)	8 (203.2)	10 13/16 (274.6)	8 1/16 (204.8)	10 3/4 (273.1)	22 3/4 (577.9)	16 3/4 (425.5)	3 5/8 (92.1)	1 1/4 (31.8)		
RL-4	300 (68.1)	4	Flanged or Grooved	31 7/16 (798.6)	10 (254.0)	12 (304.8)	9 7/16 (239.7)	12 3/4 (323.9)	20 1/2 (520.7)	19 3/4 (501.7)	4 1/8 (104.8)	1 1/2 (38.1)		
RL-5	530 (120.4)	5		37 (939.8)	12 (304.8)	14 (355.6)	11 (279.4)	16 (406.4)	23 3/4 (603.3)	23 (584.2)	5 1/4 (133.4)			
RL-6	850 (193.0)	6		44 1/16 (1,119.1)	14 (355.6)	16 13/16 (427.0)	13 1/4 (336.3)	18 (457.2)	25 3/4 (654.1)	25 (635.0)	5 11/16 (144.5)			
RL-8	1,900 (431.5)	8		54 1/2 (1,384.3)	18 (457.2)	20 (508.0)	16 1/2 (419.1)	24 (609.6)	31 3/4 (806.5)	31 (787.4)	7 11/16 (195.3)			
RL-10	3,600 (817.6)	10		64 11/16 (1,643.1)	22 (558.8)	22 3/4 (577.9)	19 15/16 (506.4)	30 (762.0)	37 3/4 (958.9)	37 3/4 (958.9)	9 5/8 (244.5)			
RL-12	4,800 (1,090.1)	12		75 3/8 (1,914.7)	27 (685.8)	25 3/4 (654.1)	22 3/8 (574.8)	36 (914.4)	45 3/4 (1,187.5)	46 3/4 (1,187.5)	11 5/8 (295.3)			
RL-14	6,100 (1,385.3)	14		95 (2,413.0)	31 1/2 (800.1)	35 (889.0)	20 1/2 (723.9)	42 (1,066.8)	54 1/2 (1,384.3)	54 1/2 (1,384.3)	14 (355.6)			
RL-16	8,000 (1,816.8)	16		105 3/4 (2,686.1)	36 (914.4)	38 1/16 (968.5)	31 7/8 (803.4)	48 (1,219.2)	62 1/2 (1,587.5)	62 1/2 (1,587.5)	16 (406.4)	2 (50.8)		
RL-18	9,700 (2,202.9)	18		123 (3,124.2)	40 1/2 (1,028.7)	44 3/4 (1,136.7)	37 3/4 (958.9)	54 (1,371.6)	70 1/4 (1,784.4)	70 1/4 (1,784.4)	18 (457.2)			
RL-20	12,000 (2,725.2)	20		135 7/8 (3,438.5)	45 (1,143.0)	48 7/8 (1,235.2)	41 3/4 (1,060.5)	60 (1,524.0)	78 (1,981.2)	78 (1,981.2)	20 (508.0)			
RL-22	15,000 (3,406.5)	22		148 (3,759.2)	49 3/4 (1,260.5)	52 5/8 (1,336.8)	45 3/4 (1,162.1)	66 (1,676.4)	85 7/8 (2,182.2)	85 7/8 (2,182.2)	22 (558.8)			
RL-24	17,000 (3,860.7)	24		159 5/8 (4,048.1)	54 (1,371.6)	56 1/8 (1,425.6)	49 1/4 (1,251.0)	72 (1,828.8)	93 1/2 (2,374.9)	93 1/2 (2,374.9)	24 (609.6)			

Model No.	Capacity GPM (M^3/Hr)	Size of Tangential Openings		DIMENSIONS IN INCHES (mm) L	M	N	Cv	Strainer Free Area in Sq. Inches (mm^2)	Weight of Brackets in Lbs. (Kg)	Approx. Volume in Gallons (Ltr.)	Approx. Shpg.Wt. in Lbs. (Kg)	Flood Wt. Less Bracket in Lbs. (Kg)
R-2	56 (12.7)	2	NPT	N/A	N/A	N/A	44	32 (20,645.1)	N/A	2 (7.6)	55 (25.0)	70 (31.8)
R-2 1/2	90 (20.4)	2 1/2					84	45 (29,032.2)		3 (11.4)	90 (40.9)	115 (52.2)
R-3	190 (43.2)	3	NPT	12 1/4 (311.2)	14 1/8 (358.8)	2	80	66 (42,580.6)	9 (4.1)	7 (26.5)	95 (43.2)	155 (70.3)
R-3	190 (43.2)	3	FLG or Grv'd	12 1/4 (311.2)	14 (355.6)		80	66 (42,580.6)		7 (26.5)	122 (55.3)	186 (84.4)
R-4	300 (68.1)	4	Flanged or Grooved	14 17/16 (373.1)	16 1/8 (409.6)		135	140 (90,322.4)		13 (49.2)	165 (75.0)	270 (122.5)
R-5	500 (113.6)	5		17 5/8 (447.7)	18 3/8 (492.1)		215			25 (94.6)	220 (100.0)	425 (192.8)
R-6	700 (159.0)	6		20 13/16 (528.6)	21 3/8 (542.9)		305	220 (141,935.2)		34 (128.7)	300 (136.4)	580 (263.1)
R-8	1,300 (295.2)	8		25 5/16 (642.9)	29 1/2 (749.3)		532	310 (199,999.6)	29 (13.2)	90 (340.7)	460 (209.1)	1,215 (551.1)
R-10	2,000 (454.2)	10		31 9/16 (801.7)	35 1/2 (901.7)		850	435 (280,644.6)		150 (567.8)	660 (300.9)	2,115 (959.4)
R-12	2,750 (624.5)	12		39 1/4 (997.0)	41 1/2 (1,054.1)		1,180	590 (380,644.4)	32 (14.5)	281 (1,101.6)	1,200 (545.5)	3,630 (1,648.6)
R-14	3,400 (772.1)	14		40 7/8 (1,038.2)	48 1/2 (1,231.9)	3	1,445	715 (461,289.4)	56 (25.4)	506 (1,915.4)	1,780 (809.1)	6,000 (2,721.6)
R-16	4,400 (999.2)	16		49 (1,244.6)	54 1/2 (1,384.3)		1,885	919 (592,902.0)		764 (2,892.0)	2,425 (1,102.3)	8,600 (3,901.7)
R-18	5,200 (1,180.9)	18		61 7/8 (1,565.3)	60 5/8 (1,539.9)		2,340	1,521 (981,288.4)	63 (28.6)	1,173 (4,440.3)	3,410 (1,550.0)	12,200 (5,987.5)
R-20	6,300 (1,430.7)	20		68 5/8 (1,743.1)	66 3/4 (1,695.5)	4	2,945	1,969 (1,263,223.2)	78 (35.4)	1,647 (6,234.6)	5,310 (2,413.6)	19,055 (8,643.4)
R-22	7,400 (1,680.5)	22		74 1/8 (1,882.8)	72 3/4 (1,847.9)		3,725	2,322 (1,490,061.5)		2,070 (7,835.8)	6,400 (2,909.1)	23,880 (10,741.3)
R-24	8,500 (1,930.4)	24		80 3/8 (2,041.5)	79 (2,006.6)		4,325	2,841 (1,832,899.6)	98 (44.5)	2,839 (9,989.7)	7,530 (3,422.7)	29,560 (13,408.4)
R-2	56 (12.7)	2	NPT	N/A	N/A	N/A	55	N/A	N/A	2 (7.6)	50 (22.7)	65 (29.5)
R-2 1/2	90 (20.4)	2 1/2					80			3 (11.4)	85 (38.6)	110 (49.9)
RL 3	190 (43.2)	3	NPT	13 3/8 (339.7)	14 1/8 (358.8)	2	215		9 (4.1)	7 (26.5)	65 (28.5)	120 (54.4)
RL-3	190 (43.2)	3	FLG or Grv'd	13 3/8 (339.7)	14 (355.6)		216			7 (26.5)	92 (41.7)	151 (68.5)
RL-4	300 (68.1)	4	Flanged or Grooved	15 3/8 (390.5)	16 1/8 (409.6)		370			13 (49.2)	100 (45.5)	210 (95.3)
RL-5	530 (120.4)	5		18 1/2 (469.8)	19 3/8 (492.1)		580			25 (94.6)	160 (72.7)	355 (165.6)
RL-6	850 (193.0)	6		22 1/8 (562.0)	21 3/8 (542.9)		850			36 (136.3)	205 (93.2)	505 (229.1)
RL 8	1,900 (431.5)	8		28 (680.4)	29 1/2 (479.5)		1,445		29 (13.2)	87(329.3)	400 (181.8)	1,130 (512.6)
RL-10	3,600 (817.6)	10		31 5/8 (803.3)	35 1/2 (901.7)		2,340	N/A		162 (613.2)	630 (286.4)	1,985 (900.4)
RL-12	4,800 (1,090.1)	12		37 5/8 (955.7)	41 1/2 (1,054.1)		3,300		32 (14.5)	282 (1,067.5)	980 (445.5)	3,335 (1,512.8)
RL-14	6,100 (1,385.3)	14		46 (1,168.4)	48 1/2 (1,231.9)	3	3,800		56 (25.4)	472 (1,786.7)	1,700 (772.7)	5,640 (2,558.3)
RL-16	8,000 (1,816.8)	16		52 (1,320.8)	54 1/2 (1,384.3)		5,100			723 (2,736.8)	2,325 (1,056.8)	8,360 (3,792.1)
RL-18	9,700 (2,202.9)	18		61 5/8 (1,565.3)	60 5/8 (1,539.9)		6,410		63 (28.6)	1,143 (4,349.4)	3,275 (1,488.6)	12,875 (5,840.1)
RL-20	12,000 (2,725.2)	20		68 (1,727.2)	66 3/4 (1,695.5)	4	8,000		78 (35.4)	1,577 (5,969.6)	5,140 (2,336.4)	18,300 (8,300.9)
RL-22	15,000 (3,406.5)	22		73 3/8 (1,870.1)	72 3/4 (1,847.9)		10,000			1,958 (7,411.8)	6,190 (2,813.6)	22,530 (10,219.8)
RL-24	17,000 (3,860.7)	24		80 (2,032.0)	79 (2,006.6)		11,700		98 (44.5)	2,463 (9,323.4)	7,465 (3,393.2)	28,020 (12,709.9)

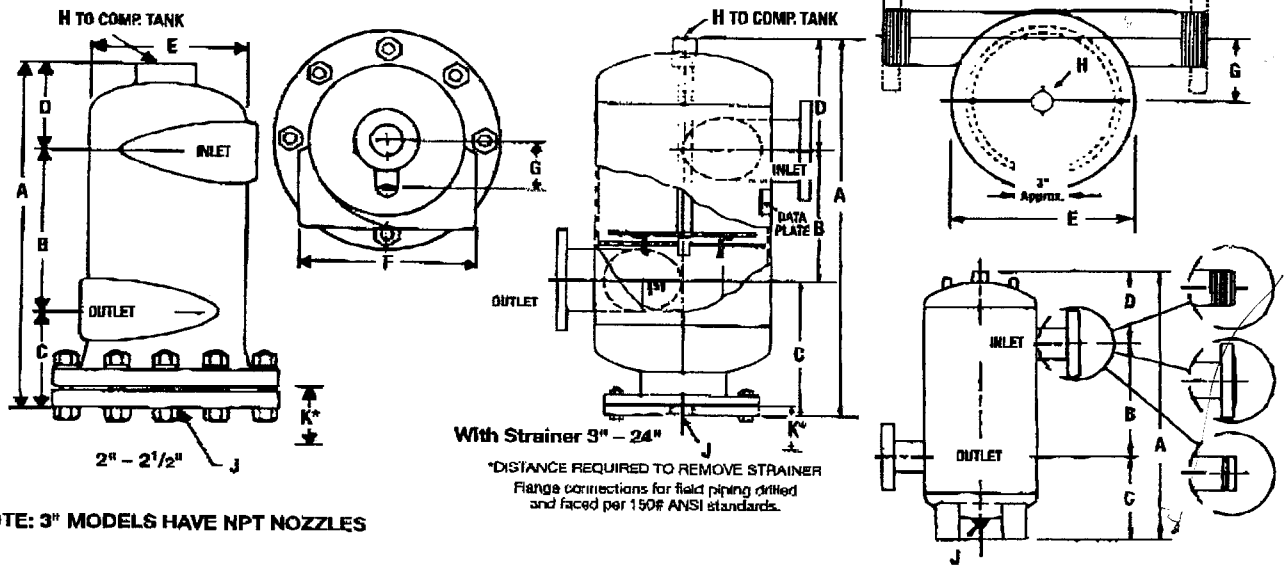
*For 26"-36" sizes, contact factory for capacities, dimensions and weights.

3442.053-MCAL-005 REV 0

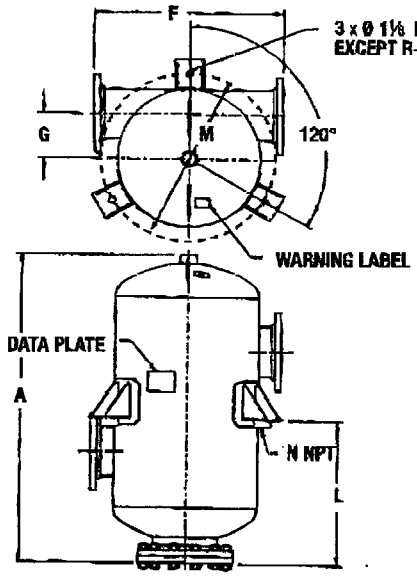
15

THE ROLAIRTROL AIR SEPARATOR (Air Control)

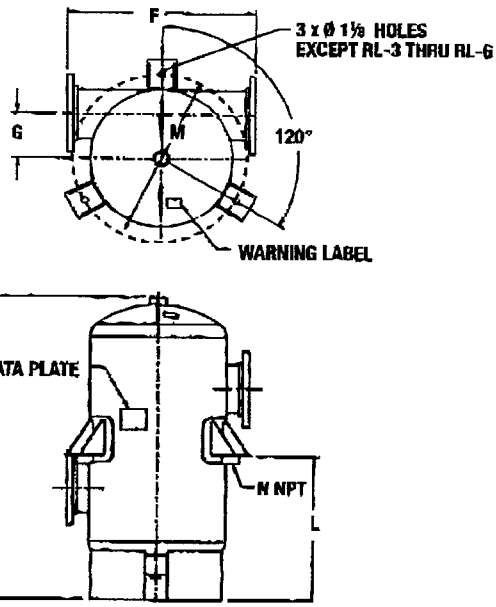
DIMENSIONS & WEIGHTS



NOTE: 3" MODELS HAVE NPT NOZZLES



3"-24" MODEL WITH STRAINER AND OPTIONAL BRACKET SUPPORTS



3"-24" MODEL LESS STRAINER AND OPTIONAL BRACKET SUPPORTS

SUPPORT NOTES

1. Model "R" Rolairtrol Air Separators have strainers which must be removed and cleaned after 24 hours operation, 30 days operation and as required to maintain proper system air separation. Before installing the model "R" Rolairtrol, refer to (K) in the dimensions and weights table (page 3), which notes minimum distances to be maintained between the blowdown connection and the floor or other equipment for strainer removal.
2. Rolairtrol sizes through an "R8" or "RL8" can be supported in the piping system as long as pipe hangers are attached to the tangential nozzles as close to the Rolairtrol shell as possible. Sizes larger than an "R8" or "RL8" will need to have additional supports such as a cradle under the Rolairtrol acting on a diameter as close to the Rolairtrol outside diameter as possible, or factory installed clips welded to the shell for overhead hanging, or floor mount support.
3. Lifting lugs are for the transportation and installation of the empty vessel, and are not to be used for complete or partial support of the flooded vessel.
4. The RL skirt can support flooded vessel weight, but an R model bottom flange (strainer housing) cannot support the flooded weight of the vessel.
5. Welding to the pressure vessel boundary will void the ASME stamp.

MODEL NUMBERING